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ECON 4160

Econometrics – Modeling and systems estimation. Autumn semester 2017.

Consult the official semester page for information about the *Schedule*, *Syllabus* and *Examination* and *Compulsory tuition activities (*as well as the course description).

As announced on the semester page before the summer, there will be a "startup" plenary session on *Monday 21. August*, see the note with a review of background material and with exercises.

The Schedule on the semester page distinguishes between teaching in Plenary sessions and in Group sessions. "Plenary sessions" are in practice thirteen regular (2x45 minutes) lectures (plus the warm-up session), and six (2x45 min) computer classes. "Group sessions" are seminars meetings (2x45) where we will work with exercise sets. The seminars are organized in two groups (Group 1 and Group 2). You choose the one most practical for you. The exercises will be posted on the semester page one week before the seminar meetings.

Course portfolio/obligatory work: One of the seminar exercise sets (details will come later) is a compulsory assignment. Your written answers to that exercise set will be graded (Pass/Failed), and you must have received the Passed grade in order to sit for the 3 hour school exam on 28. November 9:00 AM.

Plan for lectures

The details can change when the course gets under way (information will then be given in the class and on the web-page).

References to the syllabus are given as HN (= the book by Hendry and Nielsen), BN(2001/2014) (= the two books by Bårdsen and Nymoen).
Supplementing lectures notes will be made available during the semester.

Lecture 1

Maximum Likelihood based estimation and inference in three (well known) statistical models (and one that may be less known). Review of the bivariate normal model (a statistical model of a system of variables).

HN Ch 1-5, 10.2-10.3; BN (2011) Kap. 4.5.4, 5, 6.1-6.2.

Lecture 2

Notes on the multiple regression model (i.e., interpretation of coefficients, multiple testing, Delta method for non-linear derived parameters.) Matrix algebra for regression models.

HN Ch. 7, 8. BN (2011) Kap 7, BN (2014) Kap 2.

Lecture 3

Some standard misspecification tests (in models for cross section data). Important concepts for empirical econometric models: Congruence and encompassing.

HN Ch. 9, 11.1-11.2, 11.4-11.5; BN (2011) Kap. 8

Lecture 4

Time series. First and second order autoregressive processes: AR(1) and AR(2). Stable and unstable solutions. Stationarity of time series.

HN Ch. 12, BN (2011) Kap 10, BN (2014): Kap 6, 7.1-7.4.

Lecture 5

General autoregressive processes, AR. Vector autoregression, VAR. The distributed lag autoregressive model (ADL).

HN: Ch 13, 14. BN (2011): Kap 8, 10. BN (2014): Kap 7.5-7.8.

Lecture 6

Exogeneity

HN: Ch 10, 11.4, 14. BN (2014): Kap 9.

Lecture 7

Machine learning and automatic general to specific modelling.

HN: Ch. 19

Lecture 8

Identification and estimation of structural equations and models.

HN: Ch 15, BN (2011): Kap 9, BN (2014): Kap 3,7.9-7.11.

Lecture 9

Structual VAR

BN (2014), Kap 7.11

Lecture 10

Non-stationary time series.

HN: Ch 16. BN (2014) Kap 10

Lecture 11

Cointegration.

HN: Ch 17, 19.7. BN(2014) kap 11

Lecture 12

Cointegration, continued.

HN: Ch 17, 19.7. BN(2014) Kap. 11

Lecture 13

Modelling for policy and forecasting. Structural breaks.

HN: Ch 20. BN (2014) Kap 10.1.

Computer classes

As noted, there are six Computer Classes. The first CC will present the main user interface of PcGive (part of the OxMetrics family of econometric programs). PcGive is well suited for learning dynamic econometric modelling (and for use in your own projects). After the first CC, the focus of the CCs will therefore be on using PcGive for learning econometrics, not on using econometrics to learn PcGive. However, for that to work, the students must be prepared to use a little bit of time on a few tutorials in the Oxmetrics/PcGive manuals (which will be made available on the semester page).